

ACCESSION #: 9906080290

NON-PUBLIC?: N

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Edwin I. Hatch Nuclear Plant - Unit 1 PAGE: 1 OF 5

DOCKET NUMBER: 05000321

TITLE: Incorrect Performance of Equipment Clearance Leads to
Scram on High Reactor Pressure

EVENT DATE: 05/07/1999 LER #: 1999-003-00 REPORT DATE: 06/01/1999

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 53

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Steven B. Tipps TELEPHONE: (912) 367-7851

Nuclear Safety and Compliance Manager, Hatch

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE EPIX:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 05/07/1999 at 0822 EDT, Unit 1 was in the Run mode at a power level of 1465 CMWT (53 percent rated thermal power). At that time, the Unit 1 reactor automatically shut down when the Main Turbine control valves closed, resulting in a high reactor pressure condition. Reactor water level decreased due to void collapse from the rapid power reduction, resulting in receipt of a Group 2 Primary Containment Isolation System

signal and closure of Group 2 valves as designed. Level reached a minimum of approximately 32 inches below instrument zero (126 inches above top of active fuel) before being restored automatically by the Feedwater Level Control system. No emergency cooling systems actuated nor were any required to actuate to restore or maintain reactor water level. Pressure reached its maximum value of approximately 1083 psig at the time of the shutdown, decreasing thereafter until the main turbine bypass valves automatically controlled pressure. The peak pressure was below the Main Steam Safety/Relief Valve actuation setpoints; thus, no Safety/Relief Valve operation was required or occurred.

This event was caused by the manual closure of a valve common to the pump discharge of both loops of the Main Turbine ElectroHydraulic control system, which in turn caused a loss of system pressure to the Main Turbine Control Valves, resulting in their automatic closure. A plant equipment operator performed the manual valve closure in error as part of an equipment clearance evolution preceding routine changeout of an EHC discharge filter. Corrective actions included personnel discipline and procedure improvement.

TEXT PAGE 2 OF 5

TEXT PAGE 2 OF 5

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System codes appear in the text as (EIIIS Code XX).

DESCRIPTION OF EVENT

On 05/07/1999 at 0822 EDT, Unit 1 was in the Run mode at a power level of 1465 CMWT (53 percent rated thermal power). At that time, the Unit 1 reactor automatically shutdown (scrammed) when all four of the Main Turbine (EIIIS Code TA) Control Valves (TCVs, EIIIS Code TA) closed, resulting in a high reactor pressure condition. The TCVs closed due to loss of ElectroHydraulic Control (EHC, EIIIS Code TG) system fluid pressure. In turn, the closure of the TCVs resulted in Reactor Vessel pressure increasing from approximately 950 psig to 1083 psig at the time of the

scram. Following the scram, pressure dropped as the Main Turbine Bypass Valves (BPVs, EIIS Code SO) opened, and decreased until the Bypass Valves automatically adjusted and controlled pressure per design.

Reactor water level decreased from its normal level of 37 inches above instrument zero due to void collapse from the rapid reduction in reactor power. Water level decreased to a minimum of approximately 32 inches below instrument zero (126 inches above the top of the active fuel) resulting in receipt of a Group 2 Primary Containment Isolation System (EIIS Code JM) signal and closure of Group 2 Primary Containment Isolation Valves (EIIS Code JM) as designed. Level was restored automatically by the Reactor Feedwater Pumps (EIIS Code SJ). No Emergency Core Cooling Systems actuated nor were any required to actuate to restore or maintain reactor water level.

Reactor vessel pressure reached its maximum value of approximately 1083 psig at the time of the scram, exceeding the high reactor pressure scram setpoint of 1080 psig. (Normal reactor pressure at full power is 1035 psig.) Reactor pressure decreased after the scram until the main turbine bypass valves automatically re-closed and then maintained desired pressure. The peak pressure was below the Main Steam Safety/Relief Valves (S/RVs, EIIS Code SB) actuation setpoints, thus no Safety/Relief Valve operation was required or occurred.

CAUSE OF EVENT

This event was caused by the loss of EHC system pressure to the TCVs. The

TCVs are spring-biased in the closed direction, i. e. with a loss of EHC fluid pressure an internal spring will move the valve closed. The EHC system pressure was lost due to a valve downstream of both the EHC pumps being manually closed, thus simultaneously isolating both pumps. The Main Turbine EHC system is comprised of two subsystems, each individually capable of supplying necessary pressure and flow to the various components within the system. The day before the scram, the main control room instrumentation indicated the operating loop of the EHC system had high differential pressure across the EHC pump discharge filter. The operating system was secured and its alternate system

TEXT PAGE 3 OF 5

initiated. A plant equipment operator (PEO) assigned to the Maintenance department performance team responsible for the filter change out was instructed to isolate the filter under the control of the plant clearance and tagging procedure. The intent was to close the valve downstream of the filter to prevent backflow of pressurized fluid from the operating EHC subsystem, thus maintaining personnel safety without affecting EHC system operability. The PEO closed the correct valve, but in addition moved downstream of that valve and closed another in order to provide a double valve clearance boundary for the filter removal. However, closure of the second valve isolated the operating EHC subsystem, causing complete loss of EHC system fluid pressure.

The PEO performing the clearance activity was qualified for the specific

type of clearance being executed, and followed the clearance and tagging procedure requirements for performing clearances on non-safety related systems. However, in closing the second valve, the PEO in effect went beyond the clearance and tagging procedure scope. Thus, the cause of the event was not procedure noncompliance, but rather was cognitive personnel error.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is required by 10 CFR 50.73 (a)(2)(iv) because of the unplanned actuation of Engineered Safety Feature systems. When the TCVs closed with reactor power greater than 30 percent, reactor vessel steam dome pressure increased because steam was being generated at a rate faster than could pass through the BPVs. The Reactor Protection System (RPS, EIIS Code JC), an Engineered Safety Feature system, actuated on high reactor vessel pressure per design when pressure increased to approximately 1080 psig. Following the automatic reactor shutdown, water level decreased due to void collapse resulting in the receipt of an automatic Group 2 Primary Containment Isolation System isolation signal on low reactor water level. The Group 2 Primary Containment Isolation System is an Engineered Safety Feature system, also.

An increase in reactor vessel pressure during reactor operation compresses the steam voids and results in a positive reactivity insertion. This causes the neutron flux and thermal power transferred to the reactor coolant to increase which could challenge the integrity of the fuel

cladding and the reactor coolant pressure boundary. Therefore, the reactor is shut down automatically on high reactor vessel steam dome pressure to limit the neutron flux and thermal power increase. The automatic reactor shutdown on high pressure, along with the S/RVs, limits the peak reactor vessel pressure to less than the American Society of Mechanical Engineers Section III Code limits.

In this event, a mistakenly closed valve caused the TCVs to close. This isolated the reactor vessel from the Main Turbine resulting in an increase in reactor vessel steam dome pressure. Although the BPVs opened in response to the increase in pressure, reactor steam production was in excess of the capacity of the BPVs so pressure continued to increase. When pressure reached approximately 1080 psig, the reactor automatically shut down per design and terminated the pressure increase. No S/RVs opened nor were any required to open to limit or reduce reactor vessel pressure.

TEXT PAGE 4 OF 5

Reactor water level decreased due to void collapse from the rapid decrease in reactor power and the Group 2 Primary Containment Isolation Valves automatically closed on low reactor water level as required.

Reactor water level reached a low of approximately 32 inches below instrument zero, which is 126 inches above the top of the active fuel, after which level was restored to its normal level of approximately 37 inches above instrument zero. No Emergency Core Cooling Systems actuated nor were any required to actuate to recover or maintain water level during

or following this event. All automatic functions operated per design in response to the pressure increase and the automatic reactor shutdown.

Based on this analysis, it is concluded that this event had no adverse impact on nuclear safety. This analysis is applicable to all power levels.

CORRECTIVE ACTIONS

The PEO who mistakenly closed the EHC system valve has been placed in the plant disciplinary program. Other individuals, including the maintenance mechanic involved in the filter changeout, and the operations shift supervisor, have been counseled as well. These actions, from the Maintenance and the Operations departments, have been completed.

The section of the plant equipment clearance and tagging procedure governing the actions of the involved personnel will be revised to add an additional level of review. This will be accomplished by Operations department personnel by 07/01/99.

ADDITIONAL INFORMATION

Other Systems Affected: No systems other than those already mentioned in this report were affected by this event.

Failed Components Information: No failed components directly caused or resulted from this event.

Commitment Information: This report does not create any permanent licensing commitments.

Previous Similar Events: There have been two previous events at Plant Hatch, reported in the last two years, in which an incorrectly positioned

valve resulted in an unplanned Engineered Safety Feature system actuation. Licensee Event Report 50-366/1998-003, dated 10/14/98, reported an event, with Unit 2 in the refueling mode, in which the supply to the Unit 2 scram valve air header was found isolated. This caused the scram discharge volume vent and drain valves to close, the scram valves to open, and the scram discharge volume to fill with water. The reason for the air supply valve to be closed could not be determined. Corrective actions for this event included opening the air supply valve, re-pressurizing the scram valve air header, and checking the positions of other valves in the pneumatic lineup. Because this previous event could not be

TEXT PAGE 5 OF 5

tied to clearance problems or personnel error, these corrective actions could not have prevented the event reported herein.

Licensee Event Report 50-321/1999-001, dated 05/10/99, reported an event that occurred with Unit 1 in the Cold Shutdown mode. Again, a valve was found closed that isolated the air supply to the scram valve air header, creating the same actuations as described in the previous paragraph (but on Unit 1 rather than Unit 2). The cause of this previous event was an incorrect equipment clearance stemming from an inadequate plant drawing. Corrective actions included re-opening the closed valve and initiating an as-built notice to correct the drawing. As in the other "previous event" described above, these actions were specific to that event, and could not have prevented the event described herein.

ATTACHMENT 1 TO 9906080290 PAGE 1 OF 1 ATTACHMENT 1 TO 9906080290
PAGE 1 OF 1

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SOUTHERN

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June 1, 1999

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U.S. Nuclear Regulatory Commission

ATTN: Document Control Desk

Washington, D.C. 20555

Edwin I. Hatch Nuclear Plant - Unit 1

Licensee Event Report

Incorrect Performance of Equipment Clearance

Leads to Scram on High Reactor Pressure

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv) Southern

Nuclear Operating Company is submitting the enclosed Licensee Event Report

(LER) concerning an incorrect performance of an equipment clearance which led to a scram on high reactor pressure.

Respectfully submitted,

H. L. Sumner, Jr.

IFL/eb

Enclosure: LER 50-321/1999-003

cc: Southern Nuclear Operating Company

Mr. P. H. Wells, Nuclear Plant General Manager

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*** END OF DOCUMENT ***
